strictive neurohormones in patients with and without neurocardiogenic syncope have not been studied. Forty-six (46) healthy subjects aged between 21 and 83 yrs (47 ± 3 yrs; mean ± SEM) underwent a 30-min head-up tilt test at 60º. Fourteen (14) subjects (10 female and 4 male subjects) exhibited syncope 17 ± 2 min into the tilt. The hemodynamics were recorded every 5 min and blood samples for the measure of norepinephrine (NE), epinephrine (EPI), ET-1, and angiotensin-II (A-II), were drawn at baseline 5, 10, 15 and 30 min into the tilt and immediately before syncope. Neurohumoral data at baseline (B), the maximum change during the tilt (max) and just prior to syncope (S) are presented for the control subjects (C) and the group with syncope (Sync):

Gr	Time	NE (pg/ml)	EPI (pg/ml)	ET-1 (pg/ml)	A-II (pg/ml)
C	B	228 ± 15	25.8 ± 3.9	0.65 ± 0.03	15.3 ± 2
n = 32	Max	+227 ± 16†	+58.8 ± 9.5†	+0.09 ± 0.04†	+3.3± 1.0
S	B	174 ± 29	27.7 ± 5.4	0.60 ± 0.08	18.0 ± 3.56
n = 14	S	+262 ± 40†	+104 ± 23*†	−0.05 ± 0.09*	+2.2± 1.9

*p < 0.05 vs control; † p < 0.05 vs B; Gr = group.

Conclusions: Patients who presented syncope exhibited an increase in adrenomedullary (EPI) activation but no increase in ET-1 release prior to syncope. Failure of ET-1 to increase during head-up tilt test may play a role in the inability to support acute orthostatic stress.

1001-82 History of Injury during Syncope is the Most Powerful Predictor of Electrophysiologic Findings in Patients with Syncope of Unknown Origin

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Electrophysiologic studies (EPS) have been used to uncover the underlying arrhythmic mechanism in patients (pts) with unexplained syncope. We investigated whether clinical and noninvasive laboratory variables can predict the results of EPS in 423 consecutive unselected pts (176 pts with and 246 pts without structural heart disease (HD)).

Results: 77/175 pts (44%) with and 66/248 pts (26%) without HD had electrophysiologic abnormalities.

Abnormal EPS	HD (77 pts)	noHD (66 pts)	p-value
ventricular tachycardia	40 pts	0	0.001
supraventricular tachycardia	13 pts	42 pts	0.004
bradyarrhythmia	24 pts	24 pts	0.035

An abnormal EPS in pts with HD was best defined by the following variables using univariate analysis: ejection fraction (p = 0.0001), injury during syncope (p = 0.001) non sustained ventricular tachycardia during Holter monitoring (p = 0.004), positive late potentials (p = 0.013) and > 10 VPB/h (p = 0.022). In pts with normal hearts only a history of injury was of predictive value (p = 0.03). By the use of a logistic regression model the history of injury during syncope and ejection fraction were the only independent predictors of a positive EPS response in pts with HD. In pts without HD the only independent predictor of a positive EPS response was a history of injury during syncope.

Conclusion: A history of injury during syncope predicts best a positive EPS finding as a substrate for an arrhythmic event.

1002 The Use of MRI/CT/PET to Study Metabolism, Innervation, and Activation in Ischemia and Hypertrophy

Tuesday, March 18, 1997, Noon–2:00 p.m.
Anaheim Convention Center, Hall E
Presentation Hour: 1:00 p.m.–2:00 p.m.

1002-97 Normal High Energy Phosphate Ratios in "Stunned" Human Myocardium

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There is conflicting evidence in animal models whether alterations in cardiac high-energy phosphates (HEP) occur in post-ischemic "stunned" myocardium. HEPs have not been previously studied in stunned human myocardium. We measured myocardial HEP in patients presenting with acute anterior myocardial infarction successfully reperfused within six hours of symptoms onset. Myocardial creatine phosphate to ATP (PCr/ATP) ratios were measured at rest with spatially-localized 31P NMR spectroscopy (ISIS) and regional function was evaluated with cine MRI early (avg. 4 days, n = 29) and late (avg. 39 days, n = 21) after presentation. Contractility, scored varying from 0 (hyperkinesis) to 6 (dyskinesis), improved in the septal wall (mean ± SD) from 2.46 ± 0.68 to 1.54 ± 0.78 (p < 0.001), in the antero-septal wall from 2.0 ± 0.89 to 1.40 ± 0.75 (p < 0.001) and in the anterior wall from 2.37 ± 0.71 to 1.41 ± 0.59 (p < 0.001). Despite the spontaneous improvement in contractility between studies characteristic of stunned myocardium, the late PCr/ATP ratio (1.53 ± 0.17) was unchanged from that measured early (1.51 ± 0.17, p = 0.6). These values were also similar to those measured in 8 normal volunteers (1.61 ± 0.18). There was no correlation between contractility scores and PCr/ATP ratio during early or late studies (p = 061 and 0.50, respectively). This study suggests that myocardial HEP metabolism, as indexed by the PCr/ATP ratios, is not altered in stunned human myocardium.

1002-98 Cardiac Phosphorus-31 Magnetic Resonance Spectroscopy During Dobutamine Stress in Elite Cyclists with Left Ventricular Hypertrophy; no Evidence for Altered High-Energy Phosphate Metabolism

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It remains to be established whether left ventricular hypertrophy (LVH) in athletes represents a physiologic or pathophysiologic response. As metabolic abnormalities have been suggested to occur in pathophysiologic LVH, we performed phosphorus 31-magnetic resonance spectroscopy (31P-MR) in athletes with echocardiographically determined LVH. The phosphocreatine (PCr) to adenosinetriphosphate (ATP) molar ratio (PCr/ATP) obtained at rest and during dobutamine stress in 18 older elite cyclists with LVH (mean age 37 years, LV mass 98.6 ± 9.7 g/m2) was compared to the PCr/ATP ratio acquired in 11 healthy control subjects (mean age 40 years, LV mass 67.0 ± 6.8 g/m2). 31P-MR spectroscopy was performed at 1.5-T (Gyroscan S15) using a 10 cm diameter surface coil and a 10 minute 3D-ISIS protocol without and with a dobutamine dose of 40 μg/kg/min.

Average PCr/ATP values were similar in athletes and controls; at rest 1.41 ± 0.20 and 1.41 ± 0.18 (p = 0.99), and during dobutamine stress 1.21 ± 0.20 and 1.16 ± 0.13, respectively (p = 0.49). The observed decrease in PCr/ATP during stress was significant (p < 0.02 and p < 0.003, respectively) but similar in athletes and controls, 0.20 ± 0.21 and 0.24 ± 0.15, respectively (p = 0.52). Rate-pressure product (25904 vs 24001 bpm*mmHg), cardiac index (3.7 vs 3.8 l/min/m2), and LV ejection fraction (63 vs 65%) were also similar in athletes and controls, respectively.

We conclude that the PCr/ATP ratio decreases to a similar extent in older cyclists with LVH and age-matched healthy controls during dobutamine stress. Accordingly, LVH as a result of long term athletic training appears not to be associated with changes in cardiac high-energy phosphate metabolism.

1002-99 Three Dimensional Current Density Reconstruction on the Cardiac Surface by Magnetocardiography: Evaluation of Physiological Pattern and Comparison With Investigations in Patients With Ischemic Heart Disease

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Imaging of cardiac electric activity may be of potential interest for the distinction between vital and avital myocardium. Multichannel magnetocardiography (MCG) has a high local resolution and may, thus, be of value in the diagnosis of myocardial vitality. In a pilot-study, 20 healthy volunteers (VOL) and 10 patients (PTS) after myocardial infarction were investigated by combined magnetic resonance imaging (MRI) of the thorax and 31-channel MCG. Measurements were brought to congruity with the help of markers on the body surface. After segmentation of the LV surface, the lungs and the body surface in MRI, a 3D-reconstruction of current density on the LV surface was performed from MRI and MCG data (software "CURRY", Philips). Current density was calculated every 5 msec during the whole QRS-complex. The 20 VOL showed strong similarities in the spatial and temporal development of current density. This development corresponded well with the known depolarization wave. The overall maximal current density reached was 1–10